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ABSTRACT

The scaling procedures and the results obtained upon applying such procedures to the student self-report data collected in 1978-1979 are outlined in this report. The first section of the paper describes the two general scaling procedures: oblique multiple groups confirmatory factor analysis and Guttman scale analysis. The second section covers the results of scaling the Self Observation Scales and the Student Questionnaire. These instruments measure classroom/school environment, personal satisfaction and perceived peer attitudes toward school. The third section contains results obtained from scaling the My Opinion Survey, an elementary-level questionnaire assessing perceived norms, attitudes and behaviors regarding drug use. The final section summarizes the results of scaling the Drug and Alcohol Survey, a secondary level questionnaire assessing perceived norms, attitudes, intentions and behaviors regarding drug use. With the exception of the Self Observation Scales, the instruments used for this study are provided in appendices. (Author/AL)

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THE NAPA PROJECT

SCALING OF STUDENT SELF-REPORT INSTRUMENTS

DECEMBER, 1979

A REPORT SUBMITTED TO THE PREVENTION BRANCH OF NIDA

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THE NAPA PROJECT

SCALING OF STUDENT SELF-REPORT INSTRUMENTS
DECEMBER, 1979

This report outlines our scaling procedures and describes the results which we obtained upon applying these procedures to the student self-report data collected in the 01 Year (1978-1979). Additional discussion of these procedures appears in our earlier (June, 1979) report to the Prevention Branch, "Description of the Outcome Data Analysis Procedures for Each First Year Study." The pretest and post-test instruments discussed in the present report are listed in Table 1 along with the outcome variables which we intended to measure by the subscales contained within these instruments. Our earlier (April, 1979) report to the Prevention Branch, "Outcome Variables and Measures" contains a detailed description of these outcome variables and their *a priori* associated subscales. The selection and development of items for these instruments has been addressed in another report (July, 1979) to the Prevention Branch, "Selection and Development of Outcome Instrumentation," and hence will not be discussed herein.

The first section of this paper describes our two general scaling procedures: oblique multiple groups confirmatory factor analysis and

Guttman scale analysis. The second section covers the results of scaling the Self Observation Scales and the Student Questionnaire. These instruments contain measures of classroom/school environment, personal satisfaction, and perceived peer attitudes toward school (see Table 1 for a more detailed list of variables). The third section contains the results obtained from scaling the My Opinion Survey, an elementary-level questionnaire assessing perceived norms, attitudes, and behaviors regarding drug use. The final section summarizes the results of scaling the Drug and Alcohol Survey, a secondary-level questionnaire assessing perceived norms, attitudes, intentions and behaviors regarding drug use.

GENERAL SCALING PROCEDURES

Scaling via Confirmatory Factory Analysis

Our general scaling procedures were described briefly in our June report on analysis plans and are discussed further below. The inter-item correlation matrix was computed for a random subsample of the data using pair-wise deletion of missing data. The matrix was subjected to confirmatory factor analysis--an oblique multiple groups factor analysis with communalities inserted into the diagonal elements of the matrix (Hunter and Cohen, 1969). The initial groupings of items were based upon *a priori* considerations of item content and the results of prior empirical studies.

TABLE 1

YEAR 01 A PRIORI MEASURES OF STUDENT SELF-REPORT OUTCOME VARIABLES BY INSTRUMENT

Outcome Variables	Pretest						Post-test				
	Student Questionnaire Pre-E1 10/78 & Pre-JH 10/78	Self Observation Scales Form C - Intermediate	Self Observation Scales Form C - Junior High	Drug and Alcohol Survey Pre-JH 10/78	Student Questionnaire ELE-2	Student Questionnaire JH-2	Self Observation Scales Form C - Intermediate	Self Observation Scales Form C - Junior High	My Opinion Survey E1-2	Drug and Alcohol Survey Sec 4/79	
Classroom/School Environment											
Perceived Teaching Style					X	X					
Personal Satisfaction											
Social Self-Esteem		X	X				X	X			
Academic Self-Esteem					X	X					
Attitudes Toward School		X	X				X	X			
Attitudes Toward Peers		X	X				X	X			
Locus of Control	X				X	X					
Decision Making										X	
Attitudes Toward Teachers		X	X				X	X			
Perceived Norms/Social Support											
Perceived Peer Attitudes Toward School					X	X					
Perceived Peer Attitudes Toward Drugs				X					X	X	
Perceived Prevalence of Drug Use									X	X	
Drug Attitudes											
Acceptance of Licit and/or Illicit Use				X					X	X	
Perceived Utility of Drug Use				X					X	X	
Knowledge Regarding Drugs										X	
Intentions Regarding Drug Use				X						X	
Behavior Regarding Drug Use				X					X	X	

Three criteria of unidimensionality were applied to test the fit of the measurement model to the data: homogeneity of content, internal consistency, and external consistency. The items within each grouping were examined to determine whether their meanings were similar. This ensured that the content of each cluster of items was interpretable unambiguously and was an indicator of the underlying construct. The statistical test for internal consistency of a cluster of items involved examining the intercorrelation of items within the cluster and computing the reliability of the cluster using Cronbach's (1951) coefficient alpha. The test for external consistency involved examining the pattern of correlations of items in one cluster with a) items in other clusters and b) other measures. The pattern of these correlations was checked for similarity (within sampling error) for all of the items within a cluster. If the initial groupings of items did not fit the data satisfactorily according to the above three criteria, the measurement model was modified by rearranging and deleting items, and the process was repeated until a set of unidimensional scales was obtained.

In addition to the three unidimensionality criteria, two other criteria were employed in scaling. First, we tried to shorten the scales by deleting certain items whose deletion did not attenuate internal consistency nor diminish the generalizability of the scale's content domain. Secondly, we tried to enhance the statistical independence of the scales by deleting items that correlated highly on two or more scales. We combined two scales into a single scale if they

did not appear to be measuring different constructs. We used this procedure only when the item content of the two scales was very similar, and the between-scale correlation was very high.

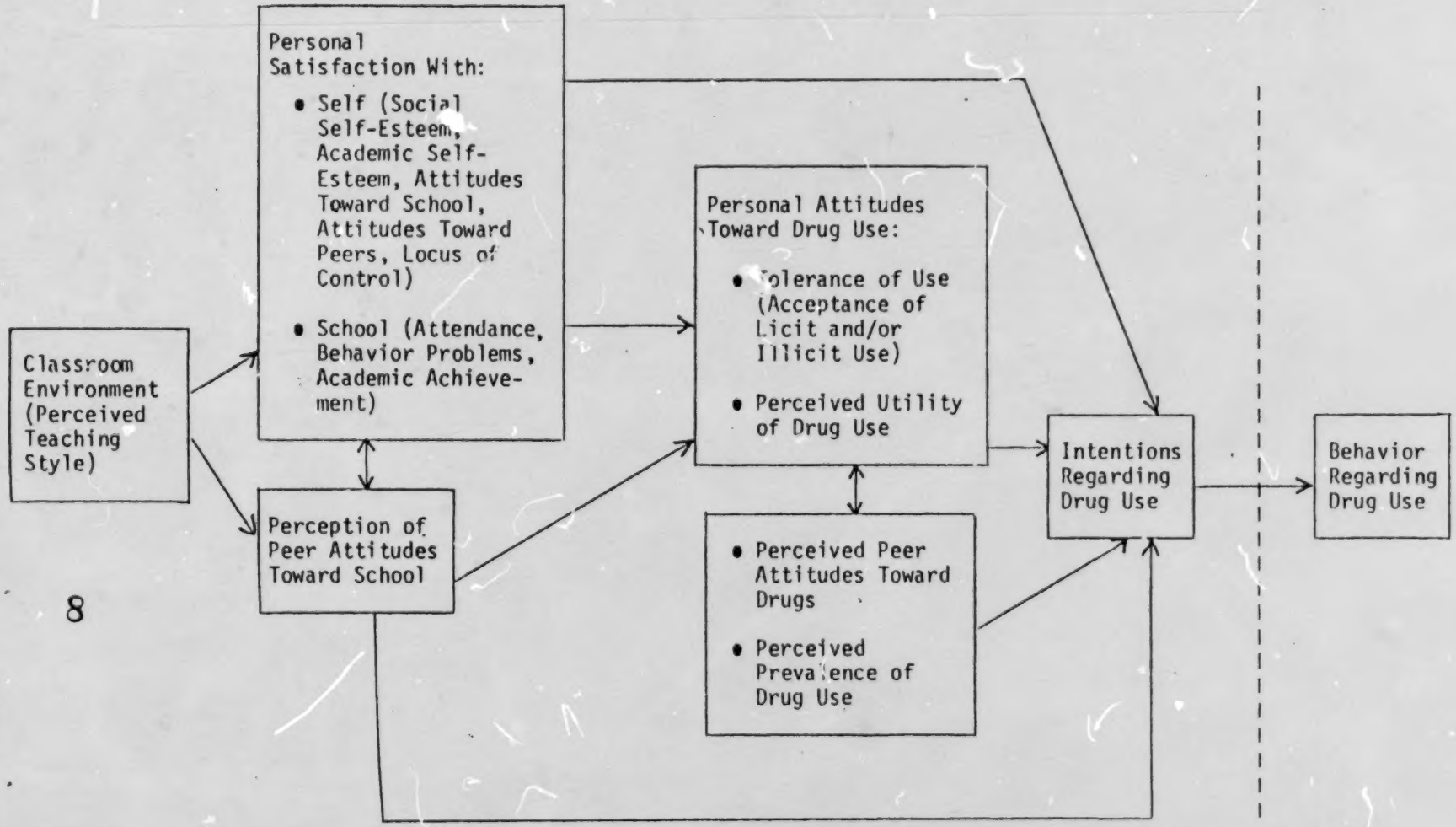
Scaling via Guttman Analysis

Guttman scale analysis is a procedure that imposes certain restrictive assumptions upon the data and provides a test of how well the data fit these assumptions. The scale must be unidimensional, a criterion employed in the factor analytic scale development described earlier. In addition, the scale must be cumulative. That is, the component items (or variables) can be ordered in such a way that an individual who responds positively to a higher-ordered item (or variable) will respond positively to all lower-ordered items (or variables). The cummulative assumption means that if one knows an individual has responded positively to three items of a five item scale, one also knows which three items the individual has endorsed. Similarly, all individuals responding positively to only three items will endorse the same three. This makes it possible to order individuals into hierarchical categories defined by the relative positions of the items they endorse.

Guttman scaling may be a useful procedure for summarizing information across many of the *variables* measured on the Drug and Alcohol Survey. The cumulative scaling requirement of Guttman analysis underlies the hypothesized change model (see Figure 1).

FIGURE 1

GENERAL CHANGE MODEL WITH OUTCOME VARIABLES


Personal Satisfaction With:
• Self (Social Self-Esteem, Academic Self-Esteem, Attitudes Toward School, Attitudes Toward Peers, Locus of Control)
• School (Attendance, Behavior Problems, Academic Achievement)
Personal Attitudes Toward Drug Use:
• Tolerance of Use (Acceptance of Licit and/or Illicit Use)
• Perceived Utility of Drug Use
Classroom Environment (Perceived Teaching Style)
Perception of Peer Attitudes Toward School
• Perceived Peer Attitudes Toward Drugs
• Perceived Prevalence of Drug Use
Intentions Regarding Drug Use
Behavior Regarding Drug Use

That is, for example, a student who indicates use of a drug (positive response) should also indicate intent to use the drug (positive response), and a positive personal attitude toward the drug. This pattern of responses is predicted by our model and would fit perfectly into a Guttman scale. Another example where Guttman scaling would be appropriate is if people who have used "hard" drugs in their lifetime have also used "soft" drugs. That is, people who have used LSD have also used marijuana and alcohol. Thus, the cumulative assumption underlying Guttman scaling imposes a model upon the data that is consistent with a hierarchical causal model such as our change model.

Guttman scale analysis provides several statistical measures of the degree of fit between the model and the data. We have employed the coefficient of reproducibility and the coefficient of scalability as estimates of cumulativity and internal consistency. The coefficient of reproducibility measures the extent to which an individual's scale score predicts the individual's response pattern. This index is the most frequently used criterion to evaluate Guttman scales. The common convention is to accept a minimum reproducibility coefficient of .90 indicating that the amount of error in the scale does not exceed 10%. The index has a major weakness however, as it does not approach zero in the absence of any internal consistency. (Borgatta, 1965). In fact, a single item can have no more error than its modal response. We have employed the scalability coefficient in conjunction with the reproducibility coefficient to overcome this deficiency. The scalability coefficient takes into account the

marginal distributions of the items and estimates the extent to which the model improves upon chance. By convention, a scalability coefficient value greater than .60 is considered indicative of a truly unidimensional and cumulative scale. The scalability coefficient possesses limitations similar to the reproducibility coefficient; nevertheless, we believe that use of both measures provides an adequate test of the degree of fit of the model to the data.

SELF OBSERVATION SCALES AND STUDENT QUESTIONNAIRES

This section describes the results of scaling 01 Year student data collected with the following self-report instruments: a) Self Observation Scales (SOS) (Intermediate Level, Form C) administered in October, 1978 and May, 1979, to students in grades 3-6; b) Self Observation Scales (Junior High Level, Form C) administered in October, 1978 and May, 1979, to students in grades 7-9; c) Student Questionnaire (Pre-El 10/78, also known as Pre-JH 10/78) administered in October, 1978, to students in grades 4-9; d) Student Questionnaire (ELE-2) administered in May, 1979 to students in grades 3-6; and e) Student Questionnaire (JH-2) administered in May, 1979 to students in grades 7-9. See Appendices A-E for copies of these instruments.

Rationale for Rescaling the Self Observation Scales

Scaling procedures were employed more extensively than described in our analysis plan, "Description of the Outcome Data Analysis Procedures for Each First Year Study." We had planned originally to scale only those measures which we developed or adapted ourselves. We did not plan to scale established measures which we simply adopted. However, due to the following considerations we decided to scale all of the measures:

a) The amount of time needed to administer the SOS and Student Questionnaire in some lower elementary classes was too great, annoying teachers and administrators. In addition, the attention span of some students was exceeded, possibly decreasing the reliability of their responses.

b) There was unnecessary repetition of items between the SOS and the Student Questionnaire at the elementary level.

c) We did not need all of the items on the SOS because only four of its seven subscales were relevant to our research. In addition, many students could not understand the vocabulary used in some of the SOS items. However, we could not modify or shorten the instrument because the scoring was performed by NTS Research Corporation using a standardized optical scanning form.

d) We learned from another user of the SOS that the advertised subscale structure did not replicate, and that the instrument measured fewer constructs than the publisher claimed.

Furthermore, the item content of several subscales seemed too heterogeneous to us. (NTS would not tell us the items belonging to each subscale.)

e) Our interactions with NTS Research Corporation over the course of the year were unsatisfactory. NTS delayed up to four months in returning scored data, and in other ways wasted a great deal of our staff time.

For these reasons, we decided to create our own scales using the SOS data collected in the fall and in the spring. We hoped to create scales which would a) be shorter in length, b) be free of irrelevant and redundant items, c) be normed on the population of interest, and d) have known psychometric properties. These revised scales could then be used in subsequent student surveys.

Data Analysis Procedures Prior to Scaling

Prior to scaling, item means, variances, and intercorrelations were compared by grade level and found to be highly similar across grades within each version (elementary and junior high) of the questionnaire. In addition, for the post-test Student Questionnaire, item intercorrelations for each grade level were subjected to confirmatory factor analysis. The results of this analysis also varied only slightly by grade level within versions of the questionnaire. Hence, scaling procedures were applied across grades within each version of the questionnaire.

Pretest Student Questionnaire and Self Observation Scales

The elementary and junior high pretest Student Questionnaires (Pre-El 10/78 and Pre-JH 10/78) are identical. These questionnaires were adapted from the Crandall Intellectual Achievement Responsibility Questionnaire (Crandall, Katkovsky, and Crandall, 1965). The instrument consists of two subscales: one measuring the child's belief in internal responsibility for intellectual and academic success, and the other measuring locus of responsibility for failure. All 34 items of the measure were employed; however, four items referring to parents were adapted to read "an adult who knows you."

The elementary sample consisted of 1040 students in grades 4-6 and the junior high sample of 1944 students in grades 7-9. Item intercorrelations were computed for each sample and subjected to the scaling procedures described earlier. The resultant elementary scales contained 12 items of locus of control for success and 10 items' locus of control for failure. The resultant junior high scales included 13 and 10 items respectively. Estimates of internal consistency reliability for each subscale were acceptable (alpha = .61 - .65). Tables 2 and 3 list for each final pretest subscale the number of items and the coefficient alpha estimate of internal consistency reliability. Tables 4 and 5 list the items contained in each final pretest subscale along with their factor loadings. These loadings are estimates of the correlation between the items and the cluster true score (i.e., the score obtained on the underlying variable when measured without error). The correlations between the subscales

TABLE 2

YEAR 01 ELEMENTARY STUDENT SURVEY PRETEST SCALING RESULTS

Subscale	Number of Items	Coefficient Alpha	Grade Levels	N
Locus of Control: Success	12	.64	4-6	1040
Locus of Control: Failure	10	.65	4-6	1040
Affective Teaching Climate	7	.74	3-6	517
Social Self-Esteem	6	.62	3-6	517
Attitudes Toward Peers	8	.76	3-6	517
Attitudes Toward School	6	.68	3-6	517

TABLE 3

YEAR 01 JUNIOR HIGH STUDENT SURVEY PRETEST SCALING RESULTS (GRADE LEVELS 7-9)

Subscale	Number of Items	Coefficient Alpha	N
Locus of Control: Success	13	.63	1944
Locus of Control: Failure	10	.61	1944
Affective Teaching Climate	8	.79	513
Social Self-Esteem	11	.80	513
Academic Self-Esteem	5	.65	513
Attitudes Toward School	8	.82	513

TABLE 4

ELEMENTARY PRETEST ITEMS AND FACTOR LOADINGS BY SUBSCALE

Locus of Control: Success

1. (.47) If an adult who knows you tells you that you are bright or clever, is it more likely

   a. because he or she is feeling good, or
   b.* because of something you did?

2. (.45) Suppose an adult who knows you says you are doing well in school. Is this likely to happen

   a.* because your school work is good, or
   b. because he or she is in a good mood?

3. (.42) If a teacher says to you, "Your work is fine," is it

   a. something teachers usually say to encourage pupils, or
   b.* because you did a good job?

4. (.37) When you find it easy to work arithmetic or math problems at school, is it usually

   a. because the teacher gave you especially easy problems, or
   b.* because you studied your book well before you tried them?

5. (.35) When you learn something quickly in school, is it usually

   a.* because you paid close attention, or
   b. because the teacher explained it clearly?

6. (.34) Suppose you became a famous teacher, scientist, or doctor. Do you think this would happen

   a. because other people helped you when you needed it, or
   b.* because you worked very hard?

7. (.34) When you do well on a test at school, is it more likely to be

   a.* because you studied for it, or
   b. because the test was especially easy?

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*internal response

Table 4 (pg. 2)

8. (.33) If people think you're bright or clever, is it

a. because they happen to like you, or
b.* because you usually act that way?

9. (.33) When you read a story and remember most of it, is it usually

a.* because you were interested in the story, or
b. because the story was well written?

10. (.33) Suppose you did better than usual in a subject at school. Would it probably happen

a.* because you tried harder, or
b. because someone helped you?

11. (.30) When you win at a game of cards or checkers, does it happen

a.* because you play real well, or
b. because the other person doesn't play well?

12. (.30) If a teacher passes you to the next grade, would it probably be

a. because he or she liked you, or
b.* because of the work you did?

Locus of Control: Failure

1. (.51) When you have trouble understanding something in school, is it usually

a. because the teacher didn't explain it clearly, or
b.* because you didn't listen carefully?

2. (.51) When you forget something you heard in class, is it

a. because the teacher didn't explain it very well, or
b.* because you didn't try very hard to remember?

3. (.46) When you don't do well on a test at school, is it

a. because the test was especially hard, or
b.* because you didn't study for it?

4. (.44) Suppose you don't do as well as usual in a subject at school. Would this probably happen

a.* because you weren't as careful as usual, or
b. because somebody bothered you and kept you from working?

Table 4 (pg. 3)

5. (.44) When you find it hard to work arithmetic or math problems at school, is it

   a.* because you didn't study well enough before you tried them, or
   b. because the teacher gave problems that were too hard?

6. (.41) Suppose an adult who knows you says you aren't doing well in your school work. Is this likely to happen more

   a.* because you work isn't very good, or
   b. because he or she is feeling cranky?

7. (.34) If you can't work a puzzle, is it more likely to happen

   a.* because you are not especially good at working puzzles, or
   b. because the instructions weren't written clearly enough?

8. (.33) If an adult who knows you tells you you're acting silly and not thinking clearly, is it more likely to be

   a.* because of something you did, or
   b. because he or she happens to feel cranky?

9. (.28) If a teacher didn't pass you to the next grade, would it probably be

   a. because she "had it in for you," or
   b.* because you school work wasn't good enough?

10. (.24) Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen

   a.* because you didn't work hard enough, or
   b. because you needed some help, and other people didn't give it to you?

Affective Teaching Climate

Y N 1. (.72) I like my teachers.

Y N 2. (.61) My teachers like to help me.

Y N 3. (.57) I usually like my teachers.

Y N 4. (.55) My teachers are mean.

Y N 5. (.50) My teachers listen to what I have to say.

Y N 6. (.46) When I do something wrong, my teachers correct me without hurting my feelings.

Y N 7. (.40) My teachers make sure I always understand what they want me to do.

Table 4 (pg. 4)

Social Self-Esteem

Y N 1. (.55) I don't have many friends.

Y N 2. (.51) The other children in my class are not friendly toward me.

Y N 3. (.51) I don't like most of the children in my class.

Y N 4. (.50) I make mistakes most of the time when I try to do things.

Y N 5. (.44) Most things are too hard to do.

Y N 6. (.27) I can't be depended on.

Attitudes Toward Peers

Y N 1. (.65) My classmates like me.

Y N 2. (.62) People are always picking on me.

Y N 3. (.59) It is hard for me to make friends.

Y N 4. (.55) I am lonely very often.

Y N 5. (.52) Other children are often mean to me.

Y N 6. (.47) Most people are much better liked than I am.

Y N 7. (.43) At school other people really care about me.

Y N 8. (.43) I am among the last to be chosen for teams.

Attitudes Toward School

Y N 1. (.68) Each morning I look forward to coming to school.

Y N 2. (.66) I feel good when I'm at school.

Y N 3. (.62) I like to stay home from school.

Y N 4. (.50) I like school better than my friends do.

Y N 5. (.33) I like to have my teachers ask me questions.

Y N 6. (.29) I would change schools if I could.

TABLE 5

JUNIOR HIGH PRETEST ITEMS AND FACTOR LOADINGS BY SUBSCALE

Locus of Control: Success

1. (.51) If an adult who knows you tells you that you are bright or clever, is it more likely

   a. because he or she is feeling good, or
   b.* because of something you did?

2. (.50) Suppose an adult who knows you says you are doing well in school. Is this likely to happen

   a.* because your school work is good, or
   b. because he or she is in a good mood?

3. (.41) When you do well on a test at school, is it more likely to be

   a.* because you studied for it, or
   b. because the test was especially easy?

4. (.38) If people think you're bright or clever, is it

   a. because they happen to like you, or
   b.* because you usually act that way?

5. (.34) When you find it easy to work arithmetic or math problems at school, is it usually

   a. because the teacher gave you especially easy problems, or
   b.* because you studied your book well before you tried them?

6. (.33) Suppose you did better than usual in a subject at school. Would it probably happen

   a* because you tried harder, or
   b. because someone helped you?

7. (.33) If a teacher says to you, "Your work is fine," is it

   a. something teachers usually say to encourage pupils, or
   b.* because you did a good job?

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*internal response

8. (.32) When you win at a game of cards or checkers, does it happen

   a.* because you play real well, or
   b. because the other person doesn't play well?

9. (.30) If a boy or girl tells you that you are bright, is it usually

   a.* because you thought up a good idea, or
   b. because they like you?

10. (.30) If a teacher passes you to the next grade, would it probably be

    a. because he or she liked you, or
    b.* because of the work you did?

11. (.26) Suppose you became a famous teacher, scientist, or doctor. Do you think this would happen

    a. because other people helped you when you needed it. or
    b.* because you worked very hard?

12. (.25) When you learn something quickly in school, is it usually

    a.* because you paid close attention, or
    b. because the teacher explained it clearly?

13. (.24) When you read a story and remember most of it, is it usually

    a.* because you were interested in the story, or
    b. because the story was well written?

Locus of Control: Failure

1. (.46) When you have trouble understanding something in school, is it usually

   a. because the teacher didn't explain it clearly, or
   b.* because you didn't listen carefully?

2. (.43) When you don't do well on a test at school, is it

   a. because the test was especially hard, or
   b.* because you didn't study for it?

3. (.40) When you forget something you heard in class, is it

   a. because the teacher didn't explain it very well, or
   b.* because you didn't try very hard to remember?

4. (.40) Suppose you don't do as well as usual in a subject at school. Would this probably happen

   a.* because you weren't as careful as usual, or
   b. because somebody bothered you and kept you from working?

5. (.38) If a teacher didn't pass you to the next grade, would it probably be

   a. because she "had it in for you," or
   b.* because your school work wasn't good enough?

6. (.37) Suppose you study to become a teacher, scientist, or doctor and you fail. Do you think this would happen

   a.* because you didn't work hard enough, or
   b. because you needed some help, and other people didn't give it to you?

7. (.36) When you find it hard to work arithmetic or math problems at school, is it

   a.* because you didn't study well enough before you tried them, or
   b. because the teacher gave problems that were too hard?

8. (.34) Suppose an adult who knows you says you aren't doing well in your school work. Is this likely to happen more

   a.* because your work isn't very good, or
   b. because he or she is feeling cranky?

9. (.33) If an adult who knows you tells you you're acting silly and not thinking clearly, is it more likely to be

   a.* because of something you did, or
   b. because he or she happens to feel cranky?

10. (.25) If you can't work a puzzle, is it more likely to happen

   a.* because you are not especially good at working puzzles, or
   b. because the instructions weren't written clearly enough?

Affective Teaching Climate

Y N 1. (.68) My teachers like to help me.

Y N 2. (.66) My teachers listen to what I have to say.

Y N 3. (.60) I like my teachers.

Y N 4. (.60) Almost all my teachers are very good.

Y N 5. (.57) I usually like my teachers.

Y N 6. (.54) When I do something wrong, my teachers correct me without hurting my feelings.

Y N 7. (.49) Most teachers treat students poorly.

Y N 8. (.39) My teachers make sure I always understand what they want me to do.

Social Self Esteem

Y N 1. (.71) It is hard for me to make friends.

Y N 2. (.71) I am easy to like.

Y N 3. (.69) I make friends easily.

Y N 4. (.52) Other students are usually fair to me.

Y N 5. (.50) I am fun to be with.

Y N 6. (.49) I can count on my friends when I'm in trouble.

Y N 7. (.48) At school other people really care about me.

Y N 8. (.47) I don't have many friends.

Y N 9. (.43) Compared to one year ago, I have more friends.

Y N 10. (.39) I am the type who has few close friends.

Y N 11. (.34) Most of my friends don't care what I think.

Academic Self Esteem

Y N 1. (.63) I am proud of my school work.

Y N 2. (.61) I am a good student.

Y N 3. (.56) I have a good memory.

Y N 4. (.40) I am proud of most things I do.

Y N 5. (.40) I am slower than most people in learning new things.

Attitudes Toward School

Y N 1. (.77) School is a big hassle.

Y N 2. (.73) I feel good when I'm at school.

Y N 3. (.68) Most mornings I look forward to going to school.

Y N 4. (.67) I like to stay home from school.

Y N 5. (.56) This school is like a jail.

Y N 6. (.51) I like school better than I used to.

Y N 7. (.46) I am proud of my school.

Y N 8. (.41) School frequently keeps me from doing what I want to do.

at the junior high and elementary levels were .33 and .34 respectively, providing support for the existence of two separate subscales.

The pretest elementary and junior high Self Observation Scales (Intermediate and Junior High-Form C) contained the following four *a priori* measures of student outcomes: social self-esteem, attitudes toward teachers, attitudes toward peers, and attitudes toward school. Scaling analyses were performed separately for elementary and junior high students, employing random subsamples from each group consisting of 517 elementary students and 513 junior high students.

At the elementary level, the final scales measured the above variables with adequate reliabilities (alpha = .62 - .76) (see Table 2). The scale assessing attitudes toward teachers was renamed, "affective teaching climate," as we felt the scale's content was broader than the original variable. Furthermore, on the post-test Student Questionnaire, we included items measuring perceived teaching style as well as items measuring attitudes toward teachers. These two subscales were too highly related to be considered separate constructs and were collapsed into one scale. The resultant post-test scale was named "affective teaching climate" to reflect its content. The scale used for the pretest is a representative subset of the items included in the final post-test scale and, hence, was also given this name.

At the junior high level, the final scales measured affective teaching climate, social self-esteem, academic self-esteem, and attitudes toward school (see Table 3). The reliabilities for these measures were acceptable (alpha = .65 - .82). The affective teaching climate scale was constructed from the attitudes toward teachers items for the reasons

above pertaining to the elementary questionnaire. The attitudes toward peers items were too highly related to the social self-esteem items to allow retention of separate measures of these variables. Hence, these items were combined forming the final social self-esteem scale. The academic self-esteem scale was constructed from five items appearing on the SOS which measured this variable.

The items comprising each final pretest subscale for elementary and junior high levels are listed in Tables 4 and 5. The items are ordered within each subscale according to their factor loadings, which are also provided. Table 6 contains the Pearson product-moment intercorrelations among the subscales for the elementary and junior high samples. The intercorrelations are moderate in value (r = .25 - .60) and are comparable for equivalent variables in the two samples. Intercorrelations average .39 in the elementary sample and .39 in the junior high sample.

Post-Test Student Questionnaire and Self Observation Scales

Scaling of the post-test Student Questionnaire (ELE-2 and JH-2) and Self Observation Scales (Form C-Intermediate and Junior High) was conducted separately on random subsamples from the elementary and the junior high school samples. The subsamples contained 513 students at the elementary level and 551 students at the junior high level. The elementary sample was composed of students in grades 3-6 and the junior high sample of students in grades 7-9.

TABLE 6

ELEMENTARY AND JUNIOR HIGH PRETEST SCALE INTERCORRELATIONS

Elementary Sample (N = 517)

	Affective Teaching Climate	Social Self-Esteem	Attitudes Toward Peers	Attitudes Toward School
Affective Teaching Climate	1.00	.28	.34	.44
Social Self-Esteem		1.00	.60	.27
Attitudes Toward Peers			1.00	.31
Attitudes Toward School				1.00

Junior High Sample (N = 513)

	Affective Teaching Climate	Social Self-Esteem	Academic Self-Esteem	Attitudes Toward School
Affective Teaching Climate	1.00	.25	.44	.50
Social Self-Esteem		1.00	.44	.28
Academic Self-Esteem			1.00	.38
Attitudes Toward School				1.00

Based upon confirmatory factor analyses, the resultant post-test subscales measure the following variables: locus of control for success; locus of control for failure; affective teaching climate; social self-esteem; attitudes toward peers (elementary only); academic self-esteem; attitudes toward school; and perceived peer attitudes toward school. The final subscales, the number of items contained within them, and their internal consistency reliabilities (coefficient alpha) can be found in Tables 7 and 8 for the elementary and junior high level. Reliabilities were acceptable for all subscales (alpha = .56 - .91) and were comparable for elementary and junior high school. Tables 9 and 10 contain for each elementary and for each junior high subscale the component items and their factor loadings.

Intercorrelations between the final subscales appear in Table 11. At the elementary level the scales intercorrelate moderately (r = .29 - .55) with a mean correlation of .41. At the junior high level the intercorrelations are small to moderate (r = .18 - .57) with an average correlation of .38.

MY OPINION SURVEY

The results of scaling the My Opinion Survey (MOS--E1-2) are described in this section. See Appendix F for a copy of this instrument. The data were collected from 1044 students in grades 4-6 in May, 1979. The analyses are based upon a random subsample consisting of 386 students with approximately equal numbers of males and females from each grade level.

TABLE 7

YEAR 01 ELEMENTARY POST-TEST SCALING RESULTS (GRADES 3-6) (N = 513)

Subscale	Number of Items	Coefficient Alpha
Locus of Control: Success	7	.56
Locus of Control: Failure	7	.62
Affective Teaching Climate	17	.91
Social Self-Esteem	6	.66
Attitudes Toward Peers	8	.80
Academic Self-Esteem	11	.79
Attitudes Toward School	6	.74
Perceived Peer Attitudes Toward School	8	.72

TABLE 8

YEAR 01 JUNIOR HIGH POST-TEST SCALING RESULTS (N = 551)

Subscale	Number of Items	Coefficient Alpha
Locus of Control: Success	7	.66
Locus of Control: Failure	7	.61
Affective Teaching Climate	18	.89
Social Self-Esteem	11	.80
Academic Self-Esteem	12	.84
Attitudes Toward School	8	.83
Perceived Peer Attitudes Toward School	8	.74

TABLE 9

ELEMENTARY POST-TEST ITEMS AND FACTOR LOADINGS BY SUBSCALE

Locus of Control: Success

1. (.59) When you do well on a test at school, is it more likely to be

   a. because you studied for it, or
   b. because the test was especially easy?

2. (.46) If an adult who knows you tells you that you are bright or clever, is it more likely

   a. because he or she is feeling good, or
   b. because of something you did?

3. (.45) When you find it easy to work arithmetic or math problems at school, is it usually

   a. because the teacher gave you especially easy problems, or
   b. because you studied your book well before you tried them?

4. (.39) Suppose an adult who knows you says you are doing well in school. Is this likely to happen

   a. because your schoolwork is good, or
   b. because he or she is in a good mood?

5. (.34) Suppose you did better than usual in a subject at school. Would it probably happen

   a. because you tried harder, or
   b. because someone helped you?

6. (.28) If you solve a puzzle quickly, is it

   a. because it wasn't a very hard puzzle, or
   b. because you worked on it carefully?

7. (.23) Suppose you weren't sure about the answer to a question your teacher asked you, but your answer turned out to be right. Is it likely to happen

   a. because she wasn't as particular as usual, or
   b. because you gave the best answer you could think of?

Locus of Control: Failure

1. (.49) When you don't do well on a test at school, is it

   a. because the test was especially hard, or
   b. because you didn't study for it?

2. (.48) When you forget something you heard in class, is it

   a. because the teacher didn't explain it very well, or
   b. because you didn't try very hard to remember?

3. (.46) When you find it hard to work arithmetic or math problems at school, is it

   a. because you didn't study well enough before you tried them, or
   b. because the teacher gave problems that were too hard?

4. (.45) Suppose an adult who knows you says you aren't doing well in your schoolwork. Is this likely to happen more

   a. because your work isn't very good, or
   b. because he or she is feeling cranky?

5. (.41) If you can't work a puzzle, is it more likely to happen

   a. because you are not especially good at working puzzles, or
   b. because the instructions weren't written clearly enough?

6. (.39) If a teacher didn't pass you to the next grade, would it probably be

   a. because she "had it in for you," or
   b. because your schoolwork wasn't good enough?

7. (.36) Suppose you don't do well as usual in a subject at school. Would this probably happen

   a. because you weren't as careful as usual, or
   b. because somebody bothered you and kept you from working?

Affective Teaching Climate

T F 1. (.73) My teacher listens to what I have to say.

Y N 2. (.71) I like my teachers.

T F 3. (.68) My teacher does not care about me.

T	F	4.	(.67)	My teacher doesn't understand me.
T	F	5.	(.66)	My teacher treats me fairly.
T	F	6.	(.66)	I like my teacher because he (she) is understanding when things go wrong.
Y	N	7.	(.65)	My teachers like to help me.
Y	N	8.	(.65)	My teachers are mean.
T	F	9.	(.65)	My teacher is not very friendly with the children.
T	F	10.	(.64)	When I do something wrong, my teacher corrects me without hurting my feelings.
T	F	11.	(.63)	My teacher cares about the feelings of the pupils in his (her) class.
T	F	12.	(.60)	My teacher is usually grouchy in class.
Y	N	13.	(.56)	My teachers make sure I always understand what they want me to do.
T	F	14.	(.55)	My teacher bosses the children around.
T	F	15.	(.54)	My teacher tries to do things that the class enjoys.
T	F	16.	(.50)	My teacher doesn't care what happens to me outside of school.
T	F	17.	(.46)	I feel like my teacher doesn't like me when I do something wrong.

Social Self-Esteem

Y	N	1.	(.58)	I don't have many friends.
Y	N	2.	(.56)	The other children in my class are not friendly toward me.
Y	N	3.	(.53)	I don't like most of the children in my class.
Y	N	4.	(.47)	I make mistakes most of the time when I try to do things.
Y	N	5.	(.43)	Most things are too hard to do.
Y	N	6.	(.42)	I can't be depended on.

Attitudes Toward Peers

Y	N	1.	(.70)	People are always picking on me.
Y	N	2.	(.63)	Other children are often mean to me.
Y	N	3.	(.60)	My classmates like me.
Y	N	4.	(.59)	At school other people really care about me.
Y	N	5.	(.58)	It is hard for me to make friends.
Y	N	6.	(.57)	I am lonely very often.
Y	N	7.	(.50)	I am among the last to be chosen for teams.
Y	N	8.	(.49)	Most people are much better liked than I am.

Academic Self-Esteem

T	F	1.	(.66)	I am proud of my schoolwork.
T	F	2.	(.64)	I am good in my schoolwork.
T	F	3.	(.57)	I am slow in finishing my schoolwork.
T	F	4.	(.54)	I am a good student.
T	F	5.	(.52)	My classmates think I am a poor student.
T	F	6.	(.48)	I can give a good report in front of the class.
T	F	7.	(.48)	I forget most of what I learn.
T	F	8.	(.45)	I can do hard homework assignments.
T	F	9.	(.45)	I often get discouraged in school.
T	F	10.	(.45)	I am not doing as well in school as I would like to.
T	F	11.	(.39)	Schoolwork is fairly easy for me.

Attitudes Toward School

Y	N	1.	(.70)	I like to stay home from school.
Y	N	2.	(.69)	I feel good when I'm at school.

Y	N	3.	(.66)	Each morning I look forward to coming to school.
Y	N	4.	(.56)	I like school better than my friends do.
Y	N	5.	(.43)	I like to have my teachers ask me questions.
Y	N	6.	(.36)	I would change schools if I could.

Perceived Peer Attitudes Toward School

T	F	1.	(.58)	Most kids in my class are proud of this school.
T	F	2.	(.55)	Most kids in my class trust their teachers.
T	F	3.	(.53)	Most kids in my class like their teachers.
T	F	4.	(.52)	Most kids in my class would rather go to a different school than this one.
T	F	5.	(.48)	Most kids in my class think this school has too many rules.
T	F	6.	(.45)	Most kids in my class think that schoolwork is a waste of time.
T	F	7.	(.44)	Most kids in my class care a lot about their schoolwork.
T	F	8.	(.38)	Most kids in my class feel like they have enough freedom in this school.

TABLE 10

JUNIOR HIGH POST-TEST ITEMS AND FACTOR LOADINGS BY SUBSCALE

Locus of Control: Success

1. (.56) When you do well on a test at school, is it more likely to be

   a. because you studied for it, or
   b. because the test was especially easy?

2. (.54) Suppose an adult who knows you says you are doing well in school. Is this likely to happen

   a. because your schoolwork is good, or
   b. because he or she is in a good mood?

3. (.50) When you find it easy to work arithmetic or math problems at school, is it usually

   a. because the teacher gave you especially easy problems, or
   b. because you studied your book well before you tried them?

4. (.47) If an adult who knows you tells you that you are bright or clever, is it more likely

   a. because he or she is feeling good, or
   b. because of something you did?

5. (.46) Suppose you did better than usual in a subject at school. Would it probably happen

   a. because you tried harder, or
   b. because someone helped you?

6. (.37) If a teacher passes you to the next grade, would it probably be

   a. because she liked you, or
   b. because of the work you did?

7. (.36) If you solve a puzzle quickly, is it

   a. because it wasn't a very hard puzzle, or
   b. because you worked on it carefully?

Locus of Control: Failure

1. (.47) If a teacher didn't pass you to the next grade, would it probably be

   a. because she "had it in for you," or
   b. because your schoolwork wasn't good enough?

2. (.46) Suppose an adult who knows you says you aren't doing well in your schoolwork. Is this likely to happen more

   a. because your work isn't very good, or
   b. because he or she is feeling cranky?

3. (.46) When you don't do well on a test at school, is it

   a. because the test was especially hard, or
   b. because you didn't study for it?

4. (.43) When you find it hard to work arithmetic or math problems at school, is it

   a. because you didn't study well enough before you tried them, or
   b. because the teacher gave problems that were too hard?

5. (.40) When you forget something you heard in class, is it

   a. because the teacher didn't explain it very well, or
   b. because you didn't try very hard to remember?

6. (.37) Suppose you don't do as well as usual in a subject at school. Would this probably happen

   a. because you weren't as careful as usual, or
   b. because somebody bothered you and kept you from working?

7. (.37) If an adult who knows you tells you you're acting silly and not thinking clearly, is it more likely to be

   a. because of something you did, or
   b. because he or she happens to feel cranky?

Affective Teaching Climate

1. (.71) My teachers like to help me.
2. (.67) I like my teachers.
3. (.66) I think most of my teachers are fair to me.
4. (.64) My teachers are interested in what I have to say.
5. (.64) My teachers listen to what I have to say.
6. (.61) I usually like my teachers.
7. (.59) My teacher makes me feel I am not good enough.
8. (.58) Most of my teachers don't try very hard to understand young people.
9. (.56) Many of my teachers are often impatient.
10. (.56) Almost all my teachers are very good.
11. (.55) Most of my teachers are still fair with me as person even when I've done poorly on my schoolwork.
12. (.51) When I do something wrong, my teachers correct me without hurting my feelings.
13. (.51) Most of my teachers like working with young people.
14. (.48) Most of my teachers do not recognize my right to a different opinion.
15. (.47) My teachers make sure I always understand what they want me to do.
16. (.45) Most of my teachers seem personally concerned about me.
17. (.44) Most of the teachers at my school cannot control their classes.
18. (.42) Most of my teachers are too concerned with discipline problems.

Social Self-Esteem

1. (.75) It is hard for me to make friends.
2. (.71) I make friends easily.
3. (.53) I don't have many friends.
4. (.53) At school other people really care about me.
5. (.52) I am easy to like.
6. (.49) Other students are usually fair to me.
7. (.49) Compared to one year ago, I have more friends.
8. (.46) Most of my friends don't care what I think.
9. (.45) I am the type who has few close friends.
10. (.40) I can count on my friends when I'm in trouble.
11. (.37) I am fun to be with.

Academic Self-Esteem

1. (.70) I am not very good in my schoolwork.
2. (.70) I am not a very good student.
3. (.67) I am proud of my schoolwork.
4. (.60) I am a good student.
5. (.58) I am not very good in my schoolwork.
6. (.58) People think I am a good student.
7. (.56) I am slow in finishing my schoolwork.
8. (.50) I am slower than most people in learning new things.
9. (.49) I forget most of what I learn.
10. (.44) I am not doing as well in school as I would like to.
11. (.43) I often get discouraged in school.
12. (.40) I am proud of most things I do.

Attitudes Toward School

1. (.76) I feel good when I'm at school.
2. (.72) School is a big hassle.
3. (.66) Most mornings I look forward to going to school.
4. (.62) I like school better than I used to.
5. (.61) I like to stay home from school.
6. (.58) I am proud of my school.
7. (.58) This school is like a jail.
8. (.41) School frequently keeps me from doing what I want to do.

Perceived Peer Attitudes Toward School

1. (.67) Most students in my grade trust their teachers.
2. (.64) Most students in my grade are proud of this school.
3. (.53) Most students in my grade look forward to coming to school.
4. (.50) Most students in my grade like their teachers.
5. (.50) Most students in my grade feel like they have enough freedom in this school.
6. (.47) Most students in my grade care a lot about their schoolwork.
7. (.44) Most students in my grade think they get the grades they deserve.
8. (.36) Most students in my grade would rather go to a different school than this one.

TABLE 11

ELEMENTARY AND JUNIOR HIGH POST-TEST SCALE INTERCORRELATIONS

Elementary Sample (N = 513)

	Affective Teaching Climate	Social Self Esteem	Attitudes Toward Peers	Academic Self Esteem	Attitudes Toward School	Perceived Peer Attitudes Toward School
Affective Teaching Climate	1.00	.29	.45	.46	.48	.55
Social Self-Esteem		1.00	.51	.49	.29	.25
Attitudes Toward Peers			1.00	.52	.32	.35
Academic Self-Esteem				1.00	.42	.36
Attitudes Toward School					1.00	.37
Perceived Peer Attitudes Toward School						1.00

Junior High Sample (N = 551)

	Affective Teaching Climate	Social Self Esteem	Academic Self Esteem	Attitudes Toward School	Perceived Peer Attitudes Toward School
Affective Teaching Climate	1.00	.18	.44	.57	.55
Social Self-Esteem		1.00	.34	.22	.17
Academic Self-Esteem			1.00	.43	.21
Attitudes Toward School				1.00	.51
Perceived Peer Attitudes Toward School					1.00

The *a priori* subscales subjected to confirmatory factor analysis included a) Attitudes Toward Licit Substance Use (items 3-12), b) Positive Utilities: Alcohol (items 33-37), c) Positive Utilities: Cigarettes (items 43-47), d) Positive Utilities: Marijuana (items 53-57), e) Negative Utilities: Alcohol (items 28-32), f) Negative Utilities: Cigarettes (items 38-42), g) Negative Utilities: Marijuana (items 48-52), h) Alcohol Involvement (items 18-21), I) Cigarette Involvement (items 13-17), and j) Marijuana Involvement (items 23-27). The involvement subscales included lifetime and current use of the substance, attitudes toward the substance, perceived peer attitudes toward the substance, and perceived peer prevalence of substance use.

The Attitudes Toward Licit Substance Use subscale did not possess adequate internal consistency (the largest alpha for any subset of items was .51) to retain. This result was due largely to the highly skewed distributions we found on most of the component items. For six of the ten items, 8% or fewer of the students selected the licit substance alternative. Furthermore, the preference for licit substances did not vary by grade level. Thus, there was little evidence for the utility of the construct for our sample.

The positive utilities for each of the substances possessed good internal consistency (alpha - .75 - .78). However, contrary to expectations, none of the positive utility subscales correlated positively with their corresponding negative utility scales (r = -.04 to .28) or with their corresponding involvement scales (r = -.06 to .08). This pattern of correlations strongly suggests that these measures lack construct validity. Hence, we will not retain the positive utility subscales. Prior to survey administration we suspected the possibility

of this outcome due to the way in which these items were worded in the questionnaire: "Do kids (drink alcohol, smoke cigarettes, or smoke marijuana) because they think it helps them . . . ." It seems that students responded to these items with the reasons they thought that *others* employed for these substances and not with the reasons they valued themselves. Although we realized that this was the most likely interpretation of the items, we had little alternative since we had received negative feedback from the school community when we submitted items with more appropriate wording for approval. Their concern was that the original wording was too suggestive and might lead students to experiment with these substances.

The negative utility and the involvement subscales for each substance possessed adequate internal consistency (alpha = .63 - .84) (see Table 12). Table 13 shows the intercorrelations among these measures. As expected, for each substance the negative utility scale correlated most highly with the involvement scale for that substance (r = .46 - .55). The intercorrelations among the three utility scales were moderately high (.49 - .64) as were the intercorrelations among the three involvement scales (.47 - .61).

Table 14 contains the items included in the final subscales along with their factor loadings. For the utility subscales the ordering of specific utility items by factor loadings varied by substance. Most important to these constructs for alcohol and cigarettes seems to be that they "make kids do poorly in school," whereas marijuana "is bad for a kid's health." The ordering of specific items for the involvement scales was quite constant across substances. For each

TABLE 12

YEAR 01 ELEMENTARY (GRADES 4-6) MY OPINION SURVEY
POST-TEST SCALING RESULTS (N=386)

Subscale	Number of Items	Coefficient Alpha
Negative Utilities: Alcohol	5	.70
Negative Utilities: Cigarettes	5	.63
Negative Utilities: Marijuana	5	.67
Alcohol Involvement	5	.77
Cigarette Involvement	5	.75
Marijuana Involvement	5	.84

TABLE 13

MY OPINION SURVEY SCALE INTERCORRELATIONS (N=386)

	Negative Utilities: Alcohol	Negative Utilities: Cigarettes	Negative Utilities: Marijuana	Alcohol Involvement	Cigarette Involvement	Marijuana Involvement
Negative Utilities: Alcohol	1.00	.52	.49	.46	.28	.31
Negative Utilities: Cigarettes		1.00	.64	.30	.47	.39
Negative Utilities: Marijuana			1.00	.37	.44	.55
Alcohol Involvement				1.00	.50	.47
Cigarette Involvement					1.00	.61
Marijuana Involvement						1.00

TABLE 14

MY OPINION SURVEY ITEMS AND FACTOR LOADINGS BY SUBSCALE

Negative Utilities: Alcohol[1]		DRINKING ALCOHOL (beer, wine, or liquor) . . .
1.	(.65)	makes kids do poorly in school.
2.	(.57)	makes a kid feel bad.
3.	(.55)	is bad for a kid's health
4.	(.54)	makes kids lose their friends
5.	(.50)	gets a kid in trouble.
Negative Utilities: Cigarettes[1]		SMOKING CIGARETTES . . .
1.	(.64)	makes kids do poorly in school.
2.	(.59)	makes kids lose their friends.
3.	(.53)	makes a kid feel bad.
4.	(.45)	gets a kid in trouble.
5.	(.31)	is bad for a kid's health.
Negative Utilities: Marijuana[1]		SMOKING MARIJUANA (grass, pot, hash) . . .
1.	(.62)	is bad for a kid's health.
2.	(.57)	makes kids lose their friends.
3.	(.57)	makes kids do poorly in school.
4.	(.49)	makes a kid feel bad.
5.	(.44)	gets a kid in trouble.

[1]All items were coded "yes"=0, "no"=2, "not sure"=1.

Alcohol Involvement

1. (.74) Have you ever drunk alcohol (beer, wine, or liquor)?

2. (.66) Have you had a drink of beer, wine, or liquor during the last four weeks?

3.[2] (.65) I think that drinking beer, wine or liquor is . . .

1___a bad thing 2___a good thing 3___not sure

4. (.62) About how many kids in your class drink beer, wine or liquor?

5.[2] (.49) Most kids in my class think that drinking beer, wine or liquor is . . .

1___a bad thing 2___a good thing 3___not sure

Cigarette Involvement

1. (.74) Have you ever smoked a cigarette?

2. (.65) Have you smoked cigarettes during the last four weeks?

3. (.64) About how many kids in your class smoke cigarettes?

4.[2] (.57) I think that smoking cigarettes is . . .

1___a bad thing 2___a good thing 3___not sure

5.[2] (.45) Most kids in my class think that smoking cigarettes is . . .

1___a bad thing 2___a good thing 3___not sure

Marijuana Involvement

1. (.86) Have you ever smoked marijuana? Marijuana is also called grass, pot, and hash.

2. (.78) Have you smoked any marijuana during the last four weeks?

3. (.75) About how many kids in your class smoke marijuana?

4.[2] (.70) I think that smoking marijuana is . . .

1___a bad thing 2___a good thing 3___not sure

5.[2] (.51) Most kids in my class think that smoking marijuana is . . .

1___a bad thing 2___a good thing 3___not sure

[2]Item was recoded "a bad thing" =0, "a good thing" =2, "not sure" =1.

substance lifetime use was most important, perceived peer attitudes was least important, and current use, attitudes, and perceived prevalence of use were intermediate in importance to the involvement construct.

DRUG AND ALCOHOL SURVEY

This section describes the results of scaling the Drug and Alcohol Survey (DAS--Sec. 4/79). See Appendix G for a copy of this instrument. The data were collected from 2590 high school students (grades 10-12) and 2915 junior high school students (grades 7-9) in April and May of 1979. A detailed summary of these data appears in our report to the Prevention Branch: "01 Year Annual Drug Survey," submitted December, 1979.

In the first part of this section, we have summarized the results of applying the factor analytic scaling procedures to measures of acceptance of drug use, perceived utility of use, and knowledge regarding drugs. In the second part we describe the results of applying factor analytic and Guttman scaling procedures to measures of involvement with specific substances. In the final part of this section the results of applying these two scaling procedures to current and lifetime polydrug use are described.

Scaling Acceptance, Perceived Utility, and Knowledge

Confirmatory factor analysis was used to scale groups of items intended to measure the following outcome variables: acceptance of licit and/or illicit use, perceived utility of drug use, and knowledge regarding drugs. The subscale corresponding to the acceptance variable is Attitudes Toward Drug-Related Behavior (items 5-21). Six subscales correspond to the perceived utility variables: Positive Utilities: Alcohol (items 22a-22h), Negative Utilities: Alcohol (items 25a-25e), Positive Utilities: Marijuana (items 26a-26h), Negative Utilities: Marijuana (items 29a-29e), Positive Utilities: Pills (defined as pep pills, sleeping pills, uppers, downers, soapers) (items 30a-30h) and Negative Utilities: Pills (items 34a-34e). One subscale corresponds to the knowledge variable: Drug Knowledge (items 23, 24, 27, 28, 31, 32, 35-38). Our earlier report to the Prevention Branch, "Outcome Variables and Measures," (April, 1979) describes the *a priori* subscales.

The factor analytic procedures were applied to the inter-item correlation matrices computed on two separate random samples, a junior high school sample (N=586) and a high school sample (N=521). The number of items contained in each final subscale and the subscale's internal consistency reliability (coefficient alpha) are provided for each sample in Table 15. The Attitudes Toward Drug-Related Behavior and the six Utilities subscales possess very high reliabilities (alpha = .81 - .93) and are comparable for both samples. In the final versions of these subscales, all of the constituent items appearing on the questionnaire were included.

TABLE 15

YEAR 01 JUNIOR (N = 586) AND SENIOR HIGH (N = 521) DRUG AND ALCOHOL SURVEY
POST-TEST SCALING RESULTS

Subscale	Number of Items	Coefficient Alpha: Junior High (Grades 7-9)	Coefficient Alpha: Senior High (Grades 10-12)
Attitudes Toward Drug-Related Behavior	17	.93	.92
Positive Utilities: Alcohol	8	.85	.84
Negative Utilities: Alcohol	5	.84	.81
Positive Utilities: Marijuana	8	.91	.91
Negative Utilities: Marijuana	5	.90	.87
Positive Utilities: Pills	8	.91	.91
Negative Utilities: Pills	5	.89	.89
Drug Knowledge	7	.40	.45

The final Drug Knowledge subscale lacks internal consistency (alpha = .40 - .45). This may reflect the fact that the items were selected from the Drug Education I curriculum and are not representative of the universe of drug knowledge items. A more likely reason for the absence of internal consistency is that an individual's knowledge about drugs comes from a variety of sources and is therefore heterogeneous. Hence, drug knowledge may be multidimensional in nature. This would attenuate the alpha coefficient which is a function of the average inter-item correlation. A list of the items included in each of the final subscales appears in Table 16. The factor loadings for each item based on the high school and junior high samples have been included also. The scale intercorrelations for the two samples appear in Tables 17 and 18. As expected, the intercorrelation between scales is moderate to high for all scales (r = .44 - .79) (items have been recoded such that a high score is pro-drug) except Drug Knowledge. This is indicative of an underlying general drug disposition. The intercorrelations are somewhat higher in the junior high sample (average r = .53) than the high school sample (average r = .49), indicating that this general disposition may become somewhat more differentiated with age.

TABLE 16

DRUG AND ALCOHOL SURVEY ITEMS BY SUBSCALE WITH FACTOR LOADINGS
BY SENIOR VERSUS JUNIOR HIGH SCHOOL

Attitudes Toward Drug-Related Behavior

	Senior High	Junior High	
1.	(.81)	(.79)	I would like the chance to get high on drugs.
2.	(.74)	(.72)	I would not use drugs even if they were legal and easy to get.
3.	(.73)	(.67)	Taking any kind of dope is a pretty dumb idea.
4.	(.69)	(.70)	If I were a parent I wouldn't mind if my kids got high once in a while.
5.	(.69)	(.67)	Taking drugs is bad bacause that would be breaking the law.
6.	(.67)	(.64)	Anyone who used drugs belongs in jail.
7.	(.66)	(.70)	It is OK for a person to use drugs if they make him feel good.
8.	(.65)	(.77)	It's OK for young people to buy alcohol if they can get away with it.
9.	(.65)	(.68)	I admire people who like to get stoned.
10.	(.65)	(.55)	Taking drugs is dangerous because they are unhealthy.
11.	(.65)	(.68)	There is really nothing wrong with using most drugs.
12.	(.64)	(.69)	People my age should not drink alcohol because it would be breaking the law.
13.	(.62)	(.64)	It's OK for a person to drink alcohol if it makes him feel better.
14.	(.60)	(.65)	I would not drink alcohol because it can harm my body.
15.	(.57)	(.67)	It's OK to try drugs once or twice just to see what they are like.
16.	(.53)	(.54)	People who get "up tight" should take pills to calm them down.
17.	(.45)	(.54)	I don't need drugs to feel good.

Positive Utilities: Alcohol

	Senior High	Junior High	How much does drinking alcohol (beer, wine, liquor) help a person to . . .
1.	(.79)	(.75)	stop feeling bored or lonely?
2.	(.73)	(.73)	feel good?
3.	(.71)	(.71)	have fun with friends?
4.	(.62)	(.64)	get away from problems?
5.	(.62)	(.67)	experience new things?
6.	(.57)	(.58)	face a difficult situation?
7.	(.56)	(.59)	do things better or be more creative?
8.	(.46)	(.49)	become popular or one of the crowd?

Negative Utilities: Alcohol

	Senior High	Junior High	Drinking alcohol . . .
1.	(.75)	(.67)	makes a person feel bad.
2.	(.74)	(.74)	makes a person lose their friends.
3.	(.68)	(.76)	makes a person do poorly in school.
4.	(.65)	(.74)	is bad for a person's health.
5.	(.58)	(.69)	gets a person in trouble with the law.

Positive Utilities: Marijuana

	Senior High	Junior High	How much does smoking marijuana (grass, pot, hash) help a person to . . .
1.	(.86)	(.85)	stop feeling bored or lonely?
2.	(.85)	(.83)	have fun with friends?
3.	(.83)	(.81)	feel good?
4.	(.77)	(.78)	experience new things?

5.	(.74)	(.73)	get away from problems?
6.	(.73)	(.68)	do things better or be more creative?
7.	(.68)	(.69)	face a difficult situation?
8.	(.57)	(.63)	become popular or one of the crowd?

Negative Utilities: Marijuana

	Senior High	Junior High	Smoking marijuana . . .
1.	(.84)	(.81)	makes a person lose their friends.
2.	(.80)	(.79)	makes a person feel bad.
3.	(.78)	(.84)	is bad for a person's health.
4.	(.72)	(.78)	makes a person do poorly in school.
5.	(.66)	(.75)	gets a person in trouble with the law.

Positive Utilities: Pills

	Senior High	Junior High	How much does taking pills (pep pills, sleeping pills, uppers, downers, soapers) help a person to . . .
1.	(.82)	(.83)	stop feeling bored or lonely?
2.	(.81)	(.84)	feel good?
3.	(.80)	(.78)	have fun with friends?
4.	(.79)	(.74)	experience new things?
5.	(.74)	(.75)	get away from problems?
6.	(.72)	(.67)	do things better or be more creative?
7.	(.72)	(.68)	face a difficult situation?
8.	(.61)	(.65)	become popular or one of the crowd?

Negative Utilities: Pills

	Senior High	Junior High	Taking pills . . .
1.	(.82)	(.79)	makes a person lose their friends.
2.	(.80)	(.80)	makes a person do poorly in school.
3.	(.79)	(.76)	makes a person feel bad.
4.	(.78)	(.82)	is bad for a person's health.
5.	(.75)	(.80)	gets a person in trouble with the law.

Drug Knowledge

	Senior High	Junior High	
1.	(.51)	(.55)	The substance in marijuana that gets you high is _____. 1. PCP 2. LSD 3. opium 4.* THC
2.	(.40)	(.28)	Which of the following drugs is a depressant (downer)? 1. marijuana 2.* alcohol 3. tobacco 4. LSD
3.	(.32)	(.25)	Which of the following drugs is a stimulant (upper)? 1. alcohol 2.* cocaine 3. marijuana 4. PCP
4.	(.30)	(.44)	The effects of which drug are most like the effects of alcohol? 1. marijuana 2. LSD 3. amphetamines 4.* barbiturates
5.	(.28)	(.28)	What part of the body is most likely to be damaged when alconol is used heavily? 1.* liver 2. stomach 3. heart 4. lungs
6.	(.23)	(.06)	Marijuana stays in your body _____. 1.* for a longer time than alcohol 2. for a shorter time than alcohol 3. about the same length of time as alcohol
7.	(.21)	(.23)	Which of the following drugs can be addicting? 1. alcohol 2. heroin 3. barbiturates (downers) 4.* all of these

*This response was scored 1, all other responses were scored 0.

TABLE 17

DRUG AND ALCOHOL SURVEY SCALE INTERCORRELATIONS

Junior High Sample (N = 586)

	Attitudes Toward Drug-Related Behavior	Positive Utilities: Alcohol	Negative Utilities: Alcohol	Positive Utilities: Marijuana	Negative Utilities: Marijuana	Positive Utilities: Pills	Negative Utilities: Pills	Drug Knowledge
Attitudes Toward Drug-Related Behavior	1.00	.65	.70	.66	.78	.54	.66	.12
Positive Utilities: Alcohol		1.00	.52	.82	.59	.71	.50	.07
Negative Utilities: Alcohol			1.00	.47	.73	.43	.62	.09
Positive Utilities: Marijuana				1.00	.68	.76	.55	.09
Negative Utilities: Marijuana					1.00	.50	.67	.13
Positive Utilities: Pills						1.00	.60	.10
Negative Utilities: Pills							1.00	.10
Drug Knowledge								1.00

TABLE 18

DRUG AND ALCOHOL SURVEY SCALE INTERCORRELATIONS

High School Sample (N = 521)

	Attitudes Toward Drug-Related Behavior	Positive Utilities: Alcohol	Negative Utilities: Alcohol	Positive Utilities: Marijuana	Negative Utilities: Marijuana	Positive Utilities: Pills	Negative Utilities: Pills	Drug Knowledge
Attitudes Toward Drug-Related Behavior	1.00	.62	.62	.70	.74	.50	.58	.21
Positive Utilities: Alcohol		1.00	.52	.79	.50	.64	.46	.06
Negative Utilities: Alcohol			1.00	.49	.64	.39	.54	.10
Positive Utilities: Marijuana				1.00	.66	.66	.47	.16
Negative Utilities: Marijuana					1.00	.44	.57	.20
Positive Utilities: Pills						1.00	.54	.12
Negative Utilities: Pills							1.00	.15
Drug Knowledge								1.00

Scaling Drug Involvement

The drug involvement construct is based upon our general change model (see Figure 1). For a given substance the DAS drug involvement scale includes the items corresponding to that substance which assess the following variables: a) Perceived Prevalence of Drug Use (items 43a-43k), b) Perceived Peer Attitudes Toward Drugs (items 39a-39k), c) Attitudes Toward Substances (items 3a-3k), d) Intentions Regarding Drug Use (items 42a-42k), and e) Behavior Regarding Drug Use (items 41a-41k).

The change model was conceptualized primarily as a longitudinal model. That is, changes within individuals over time are expected to concur with the direction of the arrows in the model. For example, if one's personal attitude toward drug use increases, then one's intention to use drugs should also increase. The model also has implications for individual differences existing at any single point in time. For example, individuals who have more positive attitudes toward drug use should also have greater intentions to use drugs. This latter interpretation of the model can be tested by applying Guttman scale analysis to the data currently available from the DAS. Guttman scaling not only provides a test of the model but also fits a scale to the data that is unidimensional and cumulative.

The analysis was performed on a random subsample of data from 521 high school students. Prior to analysis 15 students (2.9%) were deleted from the sample due to reporting serotonin use on ten or more occasions in their lifetime or three or more occasions in the past four weeks. This editing of the sample was performed to eliminate those students who were

most likely to have over-reported their drug use. The analysis was performed on the high school sample since drug use patterns are more fully developed for high school than junior high students especially for the "harder" drugs.

Prior to the Guttman scale analysis, the data for all substances except serotonin were subjected to confirmatory factor analysis to determine whether the involvement scales were unidimensional. Results of this analysis indicated that ten scales were unidimensional and possessed adequate internal consistency (alpha = .65 - .91).

Table 19 contains for each of the substances the factor loadings obtained on each of the component items and the coefficient alphas for the scales. Looking across substances, most important to these drug involvement measures is intentions to use, followed by life use, attitudes, current use, perceived peer attitudes, and finally perceived peer prevalence. Table 20 shows the intercorrelations among the drug involvement scales. The pattern of intercorrelations among these scales is quite varied, ranging from very low to very high (r = .09 - .73) and can be summarized best through exploratory factor analysis which will be conducted in the future.

The following procedures were employed to generate involvement scales for each of the substances through Guttman scale analysis (serotonin, LSD and heroin were excluded due to their low frequency of use). The perceived prevalence of drug use items were dichotomized based upon the obtained distribution for current drug use. The cutting points were selected to approximate the prevalence rates for each substance obtained from the sample. The cutting points that were used are listed in Table 21.

TABLE 19

DAS DRUG INVOLVEMENT SCALES BY SUBSTANCE (N = 506): RESULTS OF FACTOR ANALYSIS

Substances	Factor Loadings For Each Variable: Intentions To Use	Lifetime Use	Attitudes	Current Use	Perceived Peer Attitudes	Perceived Peer Prevalence of Use	Coefficient Alpha
Alcohol	.84	.84	.68	.78	.33	.39	.80
Cigarettes	.91	.77	.59	.88	.30	.29	.78
Marijuana	.91	.92	.84	.86	.54	.49	.89
Inhalants	.76	.56	.52	.39	.44	.28	.65
Barbiturates	.81	.76	.63	.59	.51	.34	.77
Amphetamines	.90	.87	.78	.73	.59	.50	.87
Cocaine	.90	.91	.86	.77	.69	.62	.91
PCP	.80	.75	.68	.50	.59	.40	.79
LSD	.86	.75	.75	.63	.53	.53	.83
Heroin	.43	.60	.57	.49	.46	.42	.66

TABLE 20

DRUG INVOLVEMENT SCALE INTERCORRELATIONS (N = 506)

	Alcohol	Cigarettes	Marijuana	Inhalants	Barbiturates	Amphetamines	Cocaine	PCP	LSD	Heroin
Alcohol	1.00	0.41	0.65	0.30	0.36	0.47	0.49	0.30	0.35	0.09
Cigarettes		1.00	0.54	0.38	0.44	0.52	0.41	0.40	0.35	0.22
Marijuana			1.00	0.33	0.46	0.62	0.73	0.40	0.46	0.11
Inhalants				1.00	0.60	0.45	0.35	0.56	0.48	0.53
Barbiturates					1.00	0.72	0.49	0.58	0.66	0.34
Amphetamines						1.00	0.72	0.57	0.66	0.27
Cocaine							1.00	0.47	0.64	0.24
PCP								1.00	0.62	0.53
LSD									1.00	0.41
Heroin										1.00

TABLE 21

DAS DRUG INVOLVEMENT SCALES BY SUBSTANCE: RESULTS OF GUTTMAN SCALE ANALYSIS (N = 506)

	Guttman Scale Cutting Points for Each Variable						
Substance	Current Use*	Intentions to Use	Attitudes	Perceived Peer Attitudes	Percieved Peer Prevalence of Use	Coefficient of Reproducibility	Coefficient of Scalability
Alcohol**	3	3	3	3	5	.92	.64
Cigarettes	2	2	2	3	4	.89	.60
Marijuana**	2	2	3	3	5	.89	.70
Inhalants	2	2	3	3	2	.96	.73
Barbiturates	2	2	3	3	2	.94	.70
Amphetamines	2	2	3	3	2	.94	.77
Cocaine**	2	2	3	3	3	.92	.76
PCP	2	2	3	3	2	.95	.75

* For each substance lifetime use must also be greater or equal to two for endorsement of this item.

** Reverse ordering of Perceived Prevalence and Perceived Peer Attitudes variables.

Any response greater or equal to the cutting point was considered an endorsement of the item; any score below the cutting point, as a rejection.

The perceived peer attitudes toward drug items and the attitudes toward substances items were dichotomized such that "a bad thing" and "a very bad thing" were scored as a rejection, and the other three responses as an endorsement. The intentions items were dichotomized so that any response other than "not at all" was considered an endorsement. For the current use items any response other than "none" was treated as an endorsement. In addition, for this variable, some reported lifetime use was also required for endorsement.

The change model predicts that the variables should be ordered so that attitudes, perceived attitudes and perceived prevalence lead to intentions to use drugs which leads to drug use. Each of the eight substances, scaled, was consistent with the model. The obtained ordering was perceived prevalence preceding perceived peer attitudes, preceding attitudes, preceding intentions, preceding current use. The only exceptions to this pattern occurred for alcohol, marijuana, and cocaine where perceived peer attitudes preceded perceived peer prevalence.

For two of the substances, alcohol and cigarettes, a few of the cutting points were changed in order to obtain acceptable scales. For alcohol, the cutting points for current use and intentions to use were increased by one scale point. For cigarettes the cutting point for attitudes was was decreased by one scale point. While these changes increase the likelihood of spuriously fitting the data to the model, we believe that

the changes are minor and that sufficient rationale exists to justify them.

All eight of the Guttman drug involvement scales obtained acceptable reproducibility and scalability coefficients (see Table 21). Thus, the results indicate that the data are consistent with the general change model, and conversely, that the Guttman scales adequately reflect the nature of the data.

Scaling Lifetime and Current Polydrug Use

Data from the high school sample were subjected to confirmatory factor analysis to determine whether current use of different substances and lifetime use of different substances formed unidimensional scales. The scales (including all substances except heroin and serotonin) were found to be unidimensional and to possess adequate internal consistency (alpha was .90 for lifetime polydrug use and .87 for current polydrug use). However, the lifetime and current polydrug use scales are too highly correlated (r = .79) to retain both as independent constructs. Table 22 shows the factor loadings for each substance on the lifetime and on the current polydrug use scales.

The same data were subjected to Guttman scale analysis. The items were dichotomized such that any reported use on an item was treated as endorsement of that item. Current polydrug use (reproducibility = .94, scalability = .64) scaled better than lifetime polydrug use (reproducibility = .91, scalability = .58). The latter scale was considered only marginally acceptable. The substances ordered differently on the two

TABLE 22

SUBSTANCE FACTOR LOADINGS ON LIFETIME AND CURRENT POLYDRUG USE SCALES

Substance	Lifetime Polydrug Use Factor Loadings	Current Polydrug Use Factor Loadings
Alcohol	.59	.56
Cigarettes	.63	.49
Marijuana	.75	.62
Inhalants	.66	.67
Barbiturates	.78	.71
Amphetamines	.83	.76
Cocaine	.77	.71
PCP	.68	.70
LSD	.72	.69

scales. For lifetime polydrug use they were from "softest" to "hardest": alcohol, cigarettes, marijuana, amphetamines, cocaine, barbiturates, inhalants, PCP and LSD. For current polydrug use the order was alcohol, marijuana, cigarettes, cocaine, amphetamines, barbiturates, LSD, inhalants and PCP.

Summary

Table 23 lists the final student outcome variables which are assessed by self-report measures. The table reflects the results of scaling the data collected in Year 01 and shows which outcome variables were measured at each grade level and the time of testing.

TABLE 23

YEAR 01 A POSTERIORI MEASURES OF STUDENT SELF-REPORT OUTCOME VARIABLES

Outcome Variables	Pretest		Post-test		
	Elementary (Grades 3-6)	Junior High (Grades 7-9)	Elementary (Grades 3-6)	Junior High (Grades 7-9)	Senior High (Grades 10-12)
Classroom/School Environment					
Affective Teaching Climate	X	X	X	X	
Personal Satisfaction					
Social Self-Esteem	X	X	X	X	
Academic Self-Esteem		X	X	X	
Attitudes Toward School	X	X	X	X	
Attitudes Toward Peers	X		X		
Locus of Control	X*	X	X	X	
Decision Making				X	
Perceived Norms/Social Support					
Perceived Peer Attitudes Toward School			X	X	
Perceived Peer Attitudes Toward Drugs		X	X*	X	X
Perceived Prevalence of Drug Use		X	X*	X	X
Drug Attitudes					
Acceptance of Licit and/or Illicit Use		X	X*	X	X
Perceived Utility of Drug Use		X	X*	X	X
Knowledge Regarding Drugs		X		X	X
Intentions Regarding Drug Use		X		X	X
Behavior Regarding Drug Use		X	X*	X	X

* = grades 4-6 only

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